e-ISSN: 2808-8263
p-ISSN: 2829-0976

The Effect of Jigsaw Type Cooperative Learning Model with Mind Mapping Assistance in Improving Critical Thinking Skills of Elementary School Students

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Abstract. Education is an essential asset for the nation, especially at the primary school level, where the foundation of skills and knowledge is built for the next level. However, many students face low critical thinking skills, have difficulty analyzing information, evaluating arguments, and making rational decisions. This becomes an obstacle in learning that requires in-depth understanding, including in Social Sciences (IPS). This literature review used an integrative review design that aims to analyze the effect of applying the Jigsaw-type cooperative learning model with the help of mind mapping on students' critical thinking skills in learning Social Sciences in elementary schools. The findings from this study indicate that learners are capable of sharing their thoughts, being engaged, posing questions effectively, communicating proficiently, showing a strong desire to understand the subject matter, and putting in effort. This enables them to think critically and enhance their academic performance. By utilizing interactive and cooperative teaching strategies like jigsaws and mind mapping, the aim is for students to be more involved in their education and cultivate critical thinking abilities necessary for tackling everyday challenges.

Keywords: Critical Thinking, Cooperative Jigsaw, Mind Mapping, Elementary School

How to Cite: Yuniar, H.A., Yuliyanto, A., Sofiasyari, I., Muzfirah, S., Novoyanto, T., & Faturochman. (2025). The Effect of Jigsaw Type Cooperative Learning Model with Mind Mapping Assistance in Improving Critical Thinking Skills of Elementary School Students. The 7th International Conference on Elementary Education. 7(1). 317 – 333.

INTRODUCTION

Education stands as the most significant resource for this country. The foundation laid during elementary education is crucial as it serves as a roadmap for advanced learning. The educational journey should ideally function at its best, with a focus on quality. Education should not be seen as merely enforcing the teacher's authority onto students, but rather as an endeavor to foster an environment that supports students in their personal growth. The execution of education pertains to the lifelong learning experiences of a child, marked by ongoing transitions in various educational contexts. Schools serve as the primary venues for conducting learning activities. (Dadri et al., 2019).

However, nowadays, there are many problems that students experience, such as difficulty solving problems, dependence on giving answers, low ability to argue, lack of creativity, and many other problems. The low level of students' critical thinking skills is due to the fact that the learning

process applied by the teacher is not oriented towards empowering higher-order thinking, only emphasizing conceptual understanding. This causes students' critical thinking to

be less developed in solving problems and applying the concepts they have learned in real life (Muzfirah et al., 2023). To overcome this problem, teachers apply learning methods that encourage students to think critically because if students have the ability, they will more easily solve a problem that is in front of them and will quickly solve problems no matter how difficult they are, in addition to the ability to think critically. also project-based learning methods, group discussions, and activities that challenge their thinking (Rohim et al., 2020).

Gagne further underlined that learning is an endeavor to gain information or abilities through teaching, which includes directives, instructions, and direction from a teacher or other educator. In order to improve students' critical thinking skills in classroom learning, it is a good idea for teachers to apply more exciting models. Efforts that can be made to improve student's critical thinking skills are by providing opportunities for students to build their knowledge actively, meaning that knowledge is discovered, formed, and developed by students themselves, both individually and in groups, using cooperative learning models Amir (in Mude, 2023).

The cooperative learning model is a learning model that makes students smarter. According to (Yuliyanto et al., 2023), the jigsaw-type cooperative learning model is a learning model that is used with exchanges from group to group, with a technique in which each student teaches each other something about the material they have studied in a group of experts.

Jigsaw-type cooperative learning creates the environment for enhancing analytical and critical thinking abilities and resolving challenging issues in real life so that a culture of thinking will emerge in students Almukarram (Rohim et al., 2020). The Jigsaw learning model encourages and provides opportunities for students to be skilled in communicating. This means that students are encouraged to express their opinions or ideas clearly, listen to other people respond appropriately, and ask questions well. So, indirectly, students' critical thinking abilities will develop by applying the jigsaw learning model.

To make it more interesting, this jigsaw-type cooperative learning model is assisted by a mind-mapping learning model. Mind mapping is an effective, efficient, creative, engaging, easy, and efficient way of taking notes because it maps our thoughts. It can be determined that learning through mind mapping is a way of understanding**.** activity that utilizes mind maps as a tool to remember, understand, and convey ideas/material visually using images, writing, colors, symbols, and graphic media to create exciting learning activities. Practical, interactive, and meaningful

(Yuliyanto et al., 2023). Mind maps assist learners in grasping information by encouraging them to structure it and incorporate visuals and colors. (Jones et al., 2012).

The problem that causes students' low critical thinking abilities and process skills is teachers' lack of accuracy in choosing learning strategies and models, namely the methods used in the process of learning to accomplish preset learning objectives. Every student should possess critical thinking skills. If a student already has critical thinking skills, it will be easier for him to solve or solve a problem, so he will be used to facing problems no matter how difficult (Rohim et al., 2020).

One of the most important skills to cultivate in primary education is critical thinking. As with previous research, A favorable connection was discovered between students' critical thinking abilities and their academic success. However, in reality, there are still a number of students whose critical thinking skills are low. The research also shows several reasons for students' low levels of critical thinking. One of the reasons is that the learning model is still less innovative or conventional. This learning methodology seldom ever gives students the chance to develop critical thinking skills because they more often act as passive recipients of material (Hartaningtyas & Utama, 2024).

Apart from using a suitable learning model, using the right media can also help students. Media for learning is a tool to help deliver material to students in the process of teaching and learning Ningtyas & Wuryani (Rohim et al., 2020). Any type of media can be utilized to promote the learning process by stimulating thoughts, emotions, attention, and learning abilities or skills. A student will efficiently and quickly understand that the material presented in the learning media used is appropriate and can help channel the delivery of learning.

Many research studies demonstrate that cooperative learning in the jigsaw style method, with the help of mind mapping, can improve students' critical thinking skills research (Handayani, 2020) which states that jigsaw-type cooperative learning has a significant influence on students' critical mathematical thinking abilities. Moreover, other research declares that the jigsaw-type cooperative learning model may partially improve critical thinking skills and further boost student achievement. However, no research has tried to apply the jigsaw-type cooperative learning model to improve critical thinking skills and student learning outcomes simultaneously (Purwaningsih, 2024). In other research, students can be actively involved in developing their knowledge, attitudes, and skills during the learning process. The application of the jigsaw learning method has a positive effect on the learning process, including training students in collaboration and improving their communication skills to express opinions (Purwaningsih, 2024).

Thus, According to earlier studies, using the jigsaw-type cooperative learning model with the help of mind mapping influences students' critical thinking abilities. However, several previous studies have not explicitly examined them, such as short meetings, so their effectiveness has not been seen optimally. Additionally, there are variations in the experimental and control groups' ratings. where the control scores are higher. Therefore, researchers will research more focused by analyzing how the jigsaw model assisted by mind mapping affects the achievement and application of students' critical thinking skills and comparing learners who utilize this approach compared to those who do not employ this strategy.

RESEARCH METHODS

This article use a literature review study method to investigate the research topic. A literature review study is a search method that involves collecting analizyng and interpreting data from relevant sources. This literatur review aims to identify and analyze concepts and theories that are relevant to research topic. Here are some of the result of the literature review:

1. The first study from (Haida et al., 2022) entitled “Application of the Mind Mapping Learning Model to Improve Students' Critical Thinking Ability”. This study aims to determine whether the application of the mind mapping learning model can improve students’ critical thinking abilities. This study is a Classroom Action Research (CAR) in 2 cycles. There are 4 data collection techniques used in this research, namely interviews with a semi-structured interview type, observation with 2 types of observation, namely participant observation and systematic observation, documents, and tests with a type of test, namely formative tests.
2. The second study from (Handari & Supriatna, 2023) entitled “Application of the Mind Mapping Method to Improve Students' Critical Thinking in Social Sciences Learning”. The approach used in this study is a qualitative approach with Classroom Action Research (CAR) research methods. The subjects used in this study were students of class VI B SDN Cibodas 8 Tangerang City with a total of 16 students. To get the data, the researcher used observation, test, and documentation techniques. So that in this study the researchers concluded that the use of the mind mapping method for social studies learning found an increase in students' critical thinking in class VI
3. The third study from (Mundo et al., 2024) entitled “The Influence of the Jigsaw Type Cooperative Learning Model by PAK Teachers on the Learning Motivation of Class VIII Students of SMP N 2 Sipoholon, North Tapanuli Regency, Academic Year 2023 / 2024”. The purpose of this study was to determine how much the positive and significant effect

of the Jigsaw Type Cooperative Learning Model by PAK Teachers on the Learning Motivation of Students of SMP Negeri 2 Sipoholon, North Tapanuli Regency in the 2023/2024 Learning Year. The research method used is descriptive quantitative method with inferential statistical approach. The population was all VIII grade students at SMP N 2 Sipoholon, Learning Year 2023/2024 as many as 120 people and a sample of 44 people was determined using probability sampling technique with a random type (simple random sampling). Jigsaw Type Cooperative Learning Model by the PAK Teacher which can maximally increase student learning motivation at SMP Negeri 2 Sipoholon, North Tapanuli Regency, Learning Year 2023/2024.

4. The fourth study from (Mude, 2023) entitled “Meta Analysis of the Effectiveness of the Jigsaw Type Cooperative Learning Model Judging from Students' Critical Thinking Skills in Grade 4 Elementary School Science Subjects Liberta”. This study aims to determine the Effect Size of the Jigsaw learning model in terms of students' critical thinking skills in grade 4 elementary science subjects. The research model used by researchers is meta-analysis research. The research population is in the form of scientific articles that have been published in national-scale journals about the use of the Jigsaw learning model in terms of critical thinking skills that have been published in the last 10 years. This proves that there is a significant difference between the Jigsaw learning model in improving critical thinking skills in science subjects for grade 4 elementary school students.
5. The fifth study from (Purwaningsih, 2024) entitled “Literature Study of the Effectiveness of the Jigsaw Type Cooperative Learning Model with Primary School Students' Critical Thinking Skills”. the jigsaw model is more effective in optimizing students' critical thinking skills. The results support the application of the jigsaw model in teaching and learning, because it can support better student learning outcomes.
6. The sixth study from (Rohim et al., 2020) entitled “The Influence of the Jigsaw Type Cooperative Learning Model Assisted by Interactive Media on Critical Thinking Skills of Elementary School Students”. Based on the research results, it can be It was concluded that there was an influence of using the jigsaw type cooperative learning model assisted by interactive media on elementary students' critical thinking abilities. This can be seen from the pre-test and post-test results where the average test results before using this model.
7. The seventh study from (Rahaju et al., 2023) intitled “Implications of Jigsaw Type Cooperative Teaching Techniques for the Critical Thinking Skills of Elementary School Students in Banyuwangi Regency”. The jigsaw type cooperative method provides

opportunities for students to think critically, analyze information in depth, and interact actively with other students. This can help students develop critical thinking skills and make the right decisions in everyday life. This method is also easy to apply in elementary school classes in terms of its implementation percentage of more than 80%.

8. The eighth study from (Zain et al., 2024) entitled “Analysis of Jigsaw Type Cooperative Learning on Critical Thinking Abilities of Middle School Students”. The aim of this research is to analyze literature related to improving junior high school students' critical thinking skills in science material through the Jigsaw Type Cooperative Learning learning model. The method used in this research is a literature review study, namely research carried out to analyze literature selected from several sources to become conclusions and new ideas. The results of this research are that students are able to express opinions, are responsive, can ask questions well, are skilled in communicating, are motivated to study the material well and work hard so that students can think critically and improve learning outcomes well. The benefit of this research for readers is that it can improve students' critical thinking by implementing jigsaw type cooperative learning.
9. The nineth study from (Magdalena & Maria Pawe, 2023) entitled “Improving Students' Critical Thinking Abilities Through the Jigsaw Type Cooperative Learning Model Class V Theme 6 Heat and Its Transfer Sub-theme Temperature and Heat at SD Inpres Oepoi”. Find out whether the jigsaw type cooperative learning model can improve students' critical thinking abilities. The learning model applied is successful and runs well so that students' critical thinking abilities increase.
10. The tenth study from (Kafiar et al., 2023) entitled “Application of the Jigsaw Learning Model to Improve the Critical Thinking Ability of Grade II Elementary School Students”. to analyze the application of the jigsaw model to the critical thinking abilities of grade II elementary school students. The research results prove that the learning model applied is effective in developing students' thinking abilities during the learning process.
11. The eleventh study from (Marlina, 2019) entitled “The Influence of the Jigsaw Type Cooperative Learning Model on Critical Thinking Ability in Class V”. This jigsaw type cooperative study model is said to be good in learning sequences, because it can be used as an alternative in creating an accurate way of studying.
12. The twelfth study from (Widia Sari et al., 2019) entitled “Efforts to Improve Critical Thinking Abilities and Learning Outcomes Through the Jigsaw Type Cooperative Learning Model”. The research results show that with implementation model steps Jigsaw Type Cooperative Learning can improve critical thinking skills and learning outcomes

13. The thirteenth study from (Sutrisno et al., 2019) entitled “The Effectiveness of Jigsaw Type Cooperative Learning Model on Mathematic al Critical Thinking Skills and Student Learning Independence”. Mathematical critical thinking skills in the jigsaw cooperative learning model are better than in the conventional learning model.
14. The fourteenth study from (Susanti, 2019) entitled “Critical Thinking Skills of Students at SDN Margorejo VI Surabaya Through the Jigsaw Model”.The Jigsaw learning model has been proven to enhance students' critical thinking skills compared to the lecture model
15. The fiftheenth study from (Rahaju et al., 2023) entitled “Implications of the Jigsaw Cooperative Teaching Technique on the Critical Thinking Skills of Elementary School Students in Banyuwangi Regency”. The jigsaw cooperative method provides opportunities for students to think critically, analyze information in depth, and interact actively with other students.
16. The sixteenth study from (Pratama et al., 2024)entitled “The Influence of Mind Mapping on Critical Thinking and Student Learning Outcomes”. This research aims to overcome the problem of teacher-centred learning that causes students to be less active and unmotivated in learning.
17. The seventeenth study from (B.Apirili,2022) entitled “The Effect of Jigsaw Type Cooperative Learning Strategy to Improve Students' Critical Thinking Patterns”. Sixth-grade students of SDS Bina Taruna 1 Medan Marelan improved their critical thinking patterns through the implementation of the Jigsaw model. The application of this model can optimize students' skills in analyzing information, evaluating arguments, and generating creative solutions.
18. The eighteenth study from (Widia Sari et al., 2019) entitled “Efforts to Improve Critical Thinking Abilities and Learning Outcomes Through the Jigsaw Type Cooperative Learning Model”. Based on the results, it can be concluded that students' critical thinking skills and learning outcomes on theme 6 "Heat and Its Transfer" in grade V of SD Noborejo 01, can be improved through Jigsaw cooperative learning. Consequently, Jigsaw Cooperative Teaching is recommended be implemented in thematic learning in elementary schools.
19. The nineteenth study from (Twiningsih et al., 2022) entitled “The influence of the cooperative learning model on critical and creative thinking skills in science learning for elementary school students”. This research provides empirical evidence that cooperative learning models as a whole have a positive impact on the development of students' critical thinking skills. According to the research, the jigsaw and GI models are the most effective cooperative models for optimizing their critical thinking skills.

20. The twentieth study from (Windia, 2020) entitled “Analysis of the Role of the Mind Mapping Model in Thematic Learning on the Critical Thinking Ability of Class V Students of SD Negeri 02 Petungesu Wagir Malang”. This study aims to see; the application of the Mind Mapping Model to the fifth grade students of SDN Petungsewu 02 Wagir in thematic learning, the assumptions of fifth grade students of SDN Petungsewu 02 Wagir regarding the application of the Mind Mapping Model to thematic learning, and critical improvement in thematic learning in fifth grade students of SDN Petungsewu 02 Wagir using the Model Mind Mapping. A form of mind mapping model that can improve students' critical thinking, namely a simple and attractive mind mapping model, as well as the presentation of interesting words related to learning material, especially thematic learning

LITERATUR REVIEW

Cooperative Type Jigsaw

The jigsaw-type cooperative learning model is a type of active learning consisting of heterogeneous learning teams consisting of four to five people (students in text format present the material), and each student is responsible for mastering some of the learning material (Mundo et al., 2024). The Jigsaw-type cooperative learning model is a learning model developed by Eliot Aronson (Lubis and Harahab in Firdausi, 2020). The Jigsaw Aronson cooperative learning model is a cooperative learning A structure in which learners engage in groups of five to six individuals, focusing on variety among members, collaborating effectively, and each participant is tasked with examining particular issues from the given content and sharing their findings with the rest of the group. Yelani (in Firdausi, 2020).

It is clear from the definitions, above that jigsaw-type cooperative learning is an active learning method that involves heterogeneous learning groups consisting of 4-6 students. In this model, each student is responsible for mastering a specific part of the material and conveying this information to other group members.

According to Rusman (in Dwi Poetra, 2019), there are several steps in jigsaw cooperative learning: (a). Students are divided into teams of one to five. (b). Every team member receives a distinct portion of the content. (c). Each team member receives a specific portion of the content. (d). To discuss their subsections, members of various teams who have studied the same section or subsection get together in new groups called expert groups. (e). Following the expert team discussion, each member goes back to their original group to teach their teammates about the sub-chapter they have learned while paying close attention to the other members. (f). The

outcomes of the conversation are presented by each expert panel. (g). The instructor provides an assessment. (h). closing.

According to Fitriana and Novitawati (in Yuliyanto et al., 2023), there are several steps in implementing this jigsaw model, which are as follows:

Tables 1. Steps of Jigsaw Model

Step	Teacher Activities	Student Activities
Step 1: Condition the students	Explaining learning objectives, directing the learning process	Understand learning objectives, understand the direction of the learning process
Step 2: Group students	Group students into 4-6 groups	Group as needed
Step 3: Distribution of material	Distribute material to each group	Understand and study the material
Step 4: Discussion with the expert group	Guide students in discussions	Discuss with a group of experts
Step 5: Return to the original group and discuss teaching each other to their group friends	Direct and guide students to teach their peers in their respective home groups	Teach colleagues in the home group
Step 6: Presentation	Assess student presentations	Presenting the results of the discussion
Step 7: Evaluation	Evaluate	Carrying out evaluations

Of course, this learning model has advantages and disadvantages. According to Adam (in Yuliyanto et al., 2023), the jigsaw model has the following advantages: (a). Students' sense of responsibility for their learning and that of others is increased because students not only learn for themselves but also teach it back to their group members. (b). Students' knowledge increases because students not only learn but also teach. (c). Appreciate differences and can establish good social relationships in learning. (d). Increase cooperation between group members. According to Susilo, Marli, and Salimi (in Yuliyanto et al., 2023), this model also has several disadvantages: (a). Dominate the time and flow of discussion by very active students. (b). Difficulty explaining

material for students with low reading and thinking abilities. Students without a competitive spirit cannot participate in learning smoothly. (c). Students with good intelligence tend to get bored quickly.

Mind Mapping

Mind mapping is a method of taking notes that enhances a visual approach to learning because the way to make it is by placing the main topic or core of the discussion of material in the middle and making branches, symbols, images, and colors so that it is more interesting, there is a a mix of hues, images, forms, and additional elements helps the mind to better take in the information presented (Acesta, 2020).

Characteristics of the Mind Mapping Method. According to findings from a research project examining the brain's information processing, researchers once believed that the brain handled and remembered information in a straight path, much like classic note-taking techniques. However, recent insights reveal that the brain absorbs information as a blend of visuals, auditory cues, scents, ideas, and emotions, and then organizes it into a linear format, such as through written text or spoken words. (Fitriyani et al., 2017). Four steps must be carried out in the Mind Mapping-based learning process (Fitriyani et al., 2017): overview, preview, in view, and review.

It can be concluded that mind mapping is an effective visual technique for learning in accordance with the natural way the brain works. By using mind maps, which combine elements such as images, colors, and symbols, the learning process becomes more exciting and meaningful.

Mind Mapping also has characteristics. Based on the findings of research regarding the brain's handling of information revealed that scientists once believed the brain operated in a straightforward, sequential manner similar to classic note-taking approaches. However, recent discoveries indicate that the brain absorbs data through a blend of visuals, sounds, scents, ideas, and emotions, then organizes it into a linear format, such as writing or speaking. (Fitriyani et al., 2017).

The Mind Mapping method also has advantages and disadvantages. Judging from the nature and characteristics, the advantages of the Mind Mapping learning method are as follows (Fitriyani et al., 2017): (a). Can express opinions freely. (b). Can collaborate with other friends. (c). Notes are more concise and clear. (d). More straightforward to search for notes if needed. (e). Notes are more focused on the core material. (f). Easy to see the whole picture. (g). Helps the brain to

organize, remember, compare, and make connections. (h). Makes it easy to add new information. (i). Reassessment can be faster. (j). Unique in nature.

The disadvantages of the mind-mapping learning method are as follows: (a). Only active students are involved. (b) The process does not fully occur for less enthusiastic students. (b). Students' Mind Maps vary, so teachers will be overwhelmed when checking students' Mind Maps.

Critical Thinking

Critical thinking is logical and reflective thinking that is focused on making decisions about what to believe or do. Critical thinking includes two things, namely, the ability to think critically, critical thinking ability, and critical thinking disposition (Ennis dalam Hidayanti et al., 2016). Moreover, according to Bailin (dalam Brashear et al., 1995), critical thinking is thinking that is goal-directed and purposive, "thinking aimed at forming a judgment", where the thinking itself meets standards of adequacy and accuracy.

Students who have critical thinking skills are characterized by being able to identify problems, collect the necessary information, find ways that can be used to deal with problems, use precise language, use logical reasoning, and conclude. Every student should be able to think critically, especially in social studies learning because students will continue to be faced with problems that are closely related to their lives. Students who are able to think critically will be able to solve a problem presented to them with appropriate and rational thinking (Rahayu et al., 2019). Someone with good critical thinking skills will be encouraged to think analytically to describe something that is being studied (Suteja & Setiawan, 2022).

There are several indicators to measure critical thinking abilities. According to Perkins Murphy, there are four indicators to measure critical thinking skills, namely clarification, assessment, inference, and strategy. Meanwhile, according to Ennis, there are six criteria for measuring critical thinking skills, namely Focus, Reason, Inference, Situation, Clarity, and Overview, which is abbreviated to FRISCO (Agustiani et al., 2022). Based on the critical thinking ability indicators above, some of which are related to learning, the critical thinking ability indicators that can be used include: (Yuliyanto et al., 2023) : (a). Focus is determining what to focus on in the problem. This is done so that work becomes more effective because without knowing the focus of the problem, we will waste much time. (b). Reason is giving reasons for an answer or conclusion. (c). Inference is estimating the conclusions that will be obtained. (d). The overview is checking the correct answer.

Social Sciences

Social Sciences is one of the fields delivered from elementary to junior high school levels. This discipline looks into a range of occurrences, information, ideas, and general principles concerning societal matters. Through the study of social sciences, learners are encouraged to be accountable, democratic citizens of Indonesia and the world who embrace peace. In the future, students will encounter significant challenges as life within the global community is always evolving. (Syafruddin et al., 2024).

Another opinion also says that social sciences education is a science that discusses humans and their environment. It is the environment where students grow and develop in various community activities and are faced with various problems that occur in that community (Parni et al., 2020).

Siska argued (in Aisyah & Dewi, 2024) that the purpose of social studies learning in elementary school is to study oneself and one's environment (social, cultural, and physical characteristics) and to put pressure on oneself. Therefore, social sciences are essential because they aim to improve children's thinking in the social field so that they can develop anywhere (Aisyah & Dewi, 2024). Another opinion also states that the aim The foundation of social science education was established on the premise that it is a connected academic field. Consequently, social science education should align with the objectives of National Education. Therefore, the purpose of social science education is to enhance students' skills in understanding social science fields to reach greater educational aims. (Parni et al., 2020).

RESULTS AND DISCUSSION

Harefa argued (in Zain et al., 2024) that The jigsaw type cooperative learning model influences students' ability to understand learning concepts and increases students' understanding of learning problems and problem-solving abilities. The jigsaw model gives students the opportunity to learn collaboratively, share information, and build mutual understanding. This model also makes students think logically, analyze data, and create their knowledge (Purwaningsih, 2024). In this method, each student is responsible for a specific part of the material and then shares that information with other group members (Rahaju et al., 2023). When students engage in discussions and ask each other questions, they are encouraged to think more deeply and critically about the material being studied. In addition, this jigsaw-type cooperative model involves interaction with peers who can enhance personal learning by providing feedback from their perspective. In this process, peers act as mentors, teachers, and supporters for fellow students so that they can build understanding through collaboration. Learning that involves interaction with

peers also has psychological benefits because it can reduce anxiety and stress. With the help, guidance, and feedback provided by peers, students feel more confident in the learning process.(Purwaningsih, 2024).

The use of mind mapping as a visual aid has also proven effective. Mind mapping helps students to organize information systematically, making it easier for them to organize complex ideas and concepts. The application of the mind mapping learning model also makes students more comfortable in discussing so that discussions run more smoothly. Besides that, learning becomes exciting and not dull, so the material taught is more accessible for students to understand and accept. (Haida et al., 2022). The use of this method requires students to think critically during its creation because mind mapping teaches students to understand a meaning or concept from learning and frees them to form it. (Handari & Supriatna, 2023).

The relationship between the Jigsaw learning model and mind mapping shows a strong synergy in the learning process. Students not only learn individually but also collectively, creating more prosperous and more varied discussions. Mind mapping supports a deeper understanding of the material, while interaction in groups helps students to question and criticize their understanding and the understanding of their friends. This creates a dynamic and constructive learning atmosphere, which significantly supports the development of critical thinking skills.

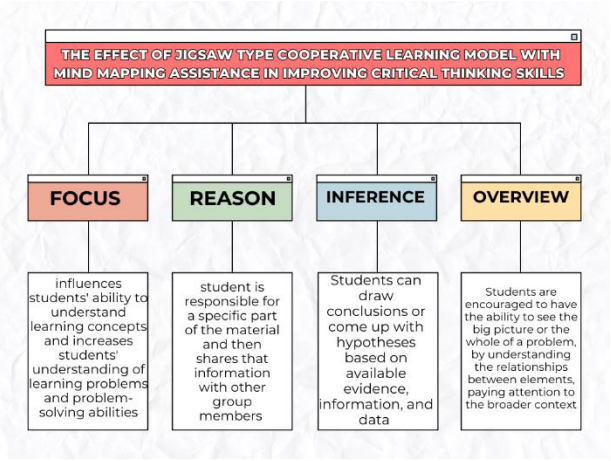

Figure 1. The effect of Jigsaw Cooperative Learning to Students

CONCLUSION

In an integrative literature review regarding the Jigsaw type cooperative learning model, mind mapping, and critical thinking, it can be concluded that these three elements support each other in increasing learning effectiveness. The Jigsaw Model not only encourages students to be

responsible for the material they are learning but also facilitates social interaction and collaboration among students. By dividing learning material into small parts that each group member masters, students are able to deepen their understanding and develop problem-solving abilities.

Apart from that, applying mind mapping as a visual technique helps students organize information in a way that is more interesting and easy to understand. Mind mapping encourages students to think critically and creatively in summarizing information, as well as facilitating more effective discussions. By combining these two methods, Learners can engage fully in the educational experience, which in turn enhances their enthusiasm and comprehension of the subject matter.

Critical thinking skills become essential in the context of social science learning, where students are faced with various complex social issues. By developing critical thinking skills, students can analyze and evaluate information better and make informed decisions. Overall, the integration of the Jigsaw learning model, mind mapping, and the development of critical thinking creates a dynamic and constructive learning environment, which can prepare students to face future challenges.

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